concentration of the metabolite in the cancer group (p = 0.040). Subsequently, EBC samples were analyzed by an LC-QTOF-Mass Spectroscopy (MS) using a non-targeted approach. A total of 625 compounds were detected in all EBC samples combined among which, four were up regulated in patients with lung cancer (T-Test, p < 0.05).
Conclusions: Lower concentrations of methanol (EBC), glycoprotein (sputum), absence of glucose in sputum identified through MRS and up regulation of four specific metabolites in EBC identified through MS in patients with known lung cancer suggest that MRS and MS may provide a lung cancer specific metabolic profile that can be used to develop a non-invasive tool to screen for lung cancer in high-risk population.

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VALIDITY OF SPECIFIC GROWTH RATE IN STAGE I NON-SMALL CELL LUNG CANCER TREATED WITH STEREOTACTIC BODY RADIOTHERAPY (SBRT)
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Purpose: Non-small cell lung cancer (NSCLC) frequently progresses during the interval between diagnosis and initiation of radiation therapy. We have previously demonstrated that tumour growth rate (GR) is an important predictor of local-regional control and survival in early lung cancer patients treated with SBRT using specific growth rate (SGR) as a metric for tumour growth rate, and its median (0.43x10-2) as a cut off to group patients into high and low SGR groups. The aim of this study was to:
1) validate SGR value of 0.43x10-2 as a metric for GR; and 2) determine the influence of pre-treatment tumour SGR on outcomes of early stage NSCLC patients treated with SBRT at a second institution.
Methods and Materials: A retrospective chart review of 160 patients with pathologically confirmed T1-2 N0 NSCLC patients treated with SBRT between June 2010 and December 2012 was undertaken. Demographic and clinical data were collected from an institutional database. Time between diagnostic and simulation CT scans was calculated (t). Diagnostic CT was uploaded to Focal planning software v.4.70. Gross tumour was contoured on each slice using lung window to calculate Gross Tumour Volume (GTV1). The pre-treatment planning CT images were uploaded from archived files to record the pre-treatment GTV (GTV2). SGR was calculated using the equation: SGR = ln (GTV2/GTV1)/t). The SGR cut offv(0.43x10-2) from our previous data was used to group patients into two cohorts. Kaplan-Meier curves were constructed for both overall (OS) and failure-free survivals (FFS), and the log rank for comparison between high and low SGR groups. Multivariate analyses were performed using a Cox proportional hazard model with SGR and other relevant clinical factors.
Results: Median time interval between initial diagnostic and planning CT scans was 87 days (range: 5-338). The median SGR was 0.418 x 10-2 (range -1.1x10-2; -5.1910-2). Median GTV1 was 3.5 cm^3 (range: 0.2; 51.9 cm^3) and median GTV2 was 6 cm^3 (range: 0.2; 79.1 cm^3). At median follow up period of 35.8 months, the median OS was 54 months. Three years OS was 60%. Patients were grouped into high and low SGR using previously reported SGR median as a cut off (0.43x10-2). The median survival was 30.3 months for high SGR versus 44.6 months for low SGR (p = 0.02). The median FFS was 36 months for high SGR versus 51.9 months for low SGR groups respectively (p < 0.01). On univariable analysis, gender (p = < 0.01), Stage T2 (p < 0.01), and GTV2 (p < 0.01) were also predictive for OS and FFS. On multivariate analysis only male gender (p = 0.006) and GTV2 (p = 0.04) were predictive for OS and high SGR (p = 0.01), male gender (p = < 0.01), and GTV2 (p = < 0.01) were independent predictors for poorer FFS.
Conclusions: This analysis of an independent data set confirmed the validity of pre-treatment SGR. High SGR was associated with poorer outcome in patients with early stage NSCLC treated with SBRT. Further work to correlate and combine its use with biological markers is ongoing.

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THE ROLE OF MID-TREATMENT 18F-FDG PET IN ASSESSING EARLY FUNCTIONAL RESPONSE AND PREDICTING OUTCOMES IN PATIENTS WITH LOCALLY ADVANCED NON-SMALL CELL LUNG CANCER UNDERGOING RADICAL CHEMORADIOTHERAPY
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Purpose: The prognostic and predictive value of 18F-FDG PET scans performed midway through curative-intent chemoradiotherapy for non-small cell lung cancer (NSCLC) remains to be established. This study aimed to determine if mid-treatment 18F-FDG PET parameters predicted for the outcome of these patients.
Methods and Materials: Between 2008 and 2012, nine consecutive patients with histologically-proven, unresected NSCLC who were fit to undergo curative-intent chemoradiotherapy (CRT) were prospectively accrued for study. 18F-FDG PET scans were performed at baseline and after 20 fractions of CRT. Mean standardized uptake value (SUVmean), maximum SUV (SUVmax) and metabolic tumour volume (MTV) were obtained. MTVs were automatically delineated at 50% of SUVmax for each lesion using a dedicated software package. Total lesion glycolysis (TLG) was calculated as mean SUV x MTV (cm^3). Changes in TLG (Δ TLG) and SUVmax (Δ SUVmax) from baseline were used to quantify early metabolic tumour responses. Patients were followed for a median of 16 months (range 5.4 – 57.1 months). Repeat FDG-PET scan scans were performed at one, three, and 12 months following treatment or if patients had symptoms suggestive of locoregional progression or recurrence. Overall survival (OS) and progression-free survival (PFS) were calculated using the Kaplan-Meier method. Log-rank tests were used to compare the two survival curves.
Results: Seven patients had AJCC Stage IIIa and two patients had Stage IIIb NSCLC. At the time of last follow up, three patients were alive and without recurrent disease. A reduction in TLG (Δ TLG) by 75% or more was associated with longer OS (12.5 versus 16.4 months, p = 0.048). Baseline TLG values of 414.8 or less were associated with longer PFS (7.2 versus 9.0 months, p = 0.048). Baseline and Δ SUVmax values were not associated with OS or PFS.
Conclusions: Early metabolic response midway through radiotherapy as quantified by Δ TLG by 75% or more was associated with longer OS. SUVmax at baseline and mid-treatment and Δ SUVmax were not associated with OS or PFS. Early identification of poor CRT responders may allow for future clinical trials to improve outcomes in these patients, such as dose escalation with an additional RT boost. Larger studies are needed to confirm these findings

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RISKS OF SABR FOR EARLY-STAGE NON-SMALL CELL LUNG CANCER WITH CO-EXISTING INTERSTITIAL LUNG DISEASE: A SYSTEMATIC REVIEW OF LITERATURE
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Purpose: Stereotactic ablative radiotherapy (SABR) is an effective treatment for patients with peripherally-located early-stage non-small cell lung cancer (ES-NSCLC). Treatment-related toxicity for SABR is uncommon, with a Grade 5 toxicity rate of 0.4% in medically operable patients [Onishi et al. 2015]. Growing evidence suggests that patients with interstitial lung disease